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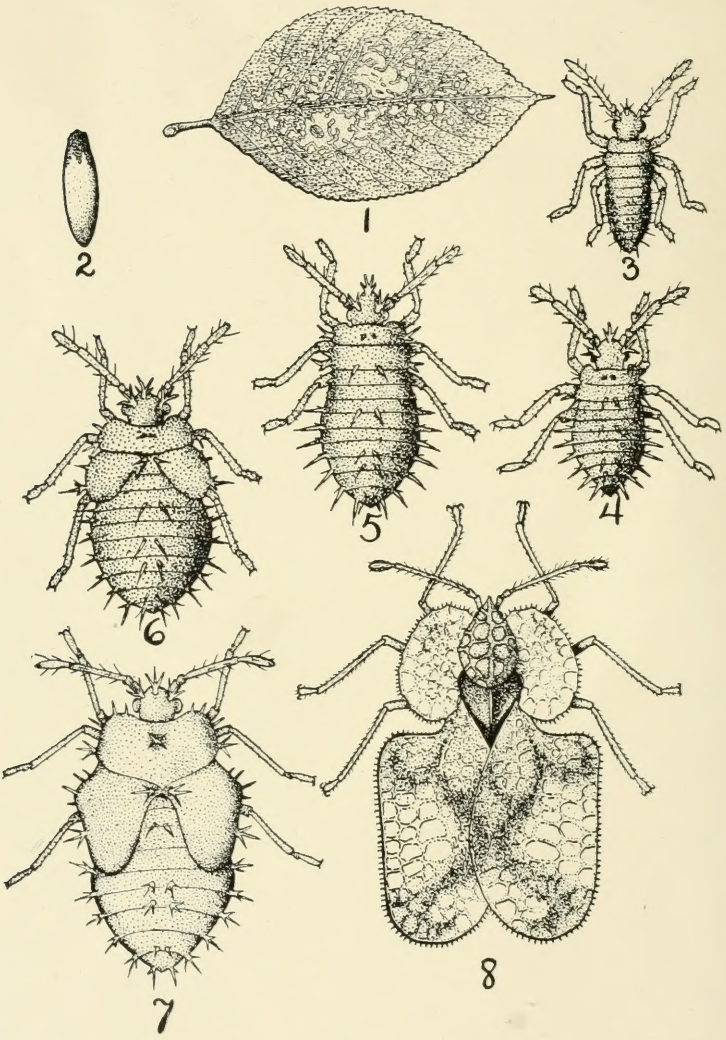

CORYTHUCHA SPINULOSA.—DICKERSON AND WEISS.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXIX. APRIL, 1918. No. 4.

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Corythucha spinulosa Gibson, a New Lace-bug on Wild Cherry (Hem., Hom.).

By EDGAR L. DICKERSON and HARRY B. WEISS*, New Brunswick, New Jersey.

(Plate VII.)

During the late summer of 1916 this species was first noted feeding on wild cherry (*Prunus serotina*) at Jamesburg, New Jersey, and observations conducted since then have resulted in the following notes. Overwintering adults first appeared during the first few days in June, females being most abundant. Unfavorable weather undoubtedly delayed their appearance several weeks. At this time scattered feeding injuries were noted usually along the mid-ribs of the leaves showing that considerable feeding took place during egg-deposition. Egg-

* The arrangement of the author's names has no significance and indicates neither seniority nor precedence.

laying started the first week in June, which was soon after emergence, and continued until about June 20, at which time only a comparatively few females were found and during which time most of the eggs were laid.

The eggs are deposited in the mid-rib on the under side of the leaf, usually in the basal portion which is pubescent. This results in the eggs being partially hidden. Most of the eggs stick out parallel to the leaf surface although some appear to be inserted perpendicular in the leaf tissue close to the mid-rib while a few are inserted in the mid rib at an angle. Only the basal rounded end of the egg is inserted in the leaf and the outer projecting part of the egg is covered with the black varnish-like excrement of the female. From 4 to 35 eggs were found in a single mid-rib, these being distributed unevenly on both sides. As a rule, each leaf contained about 15 eggs. Hatching started about June 25 and the first adults appeared July 15, the egg stage requiring from 2 to 3 weeks. The 1st, 2nd and 3rd nymphal stages required from 2 to 3 days, the 4th from 3 to 4 days and the 5th from 7 to 9 days. The 5th was undoubtedly prolonged by cool, rainy weather at that time. In fact, all stages are shortened or prolonged by favorable or unfavorable weather.

The nymphs feed in colonies on the under surface of the leaf along the mid-rib and if the individuals of a colony are separated they will later collect and feed together. While there is a tendency for some 4th and 5th stage nymphs to migrate somewhat, most of them feed together. By the last of July many adults of the first brood are present and egg laying starts, young leaves usually being selected for this purpose. By the latter part of August the first adults of a second brood are present and continue to appear well into September. On account of the length of time over which oviposition extends it is possible to find, during the summer, all stages of the nymphs at the same time. All stages feed on the under leaf surface which results in a whitish discoloration of the upper surface. The under surface is disfigured by varnish-like spots of excrement. In common with *Stephanitis pyrioides* Scott, a few

females of a previous brood can always be found lingering on the plants long after the eggs have hatched and as late as the time when 4th and 5th stage nymphs are present. The adult was described by Mr. Edmund H. Gibson, who very kindly and generously permitted us to include his description in this paper.

Egg. (Plate VII, fig. 2.) Length 0.55 mm., width 0.2 mm. Elliptical, basal half translucent, outer half dark brown. Basal end acute with rounded tip. Sides of apical half subparallel, slightly tapering toward tip. Extremity of apical end truncate with rim-like collar and central projecting cone-shaped nipple.

First stage nymph. (Plate VII, fig. 3.) Length 0.62 mm. Shape elliptical, dorsal surface of body brown, posterior half darker than anterior half. Head bears three prominent tubercles arranged in a triangle on dorsal surface. Dorsal surface of body, especially posterior portion, and lateral margins of abdominal segments bearing comparatively prominent secreting hairs. Antennae one-third length of body, white, sparsely covered with prominent secreting hairs. Rostrum white, reaching to posterior pair of legs. Legs white.

Second stage nymph. (Plate VII, fig. 4.) Length 0.8 mm. Shape similar to that of first stage, but more oval in outline. Color darker than that of first stage. Tubercles on head more pronounced. Bases of hairs tuberculate. A single spine-like tubercle on lateral margins of first and second thoracic segments and the second and remaining abdominal segments, each tubercle bearing a glandular hair. A pair of spine-like tubercles tipped with secreting hairs on the dorsal surface of the pro- and mesothorax and the second, fifth, sixth and eighth abdominal segments. Antennae white, comparatively slightly shorter than in first stage. Rostrum white, reaching to posterior legs Legs white.

Third stage nymph. (Plate VII, fig. 5.) Length 1.1 mm. Shape oval, dorsal surface brownish black. Tubercles as in preceding stage. Sides of thorax and abdomen margined. Eyes prominent. Antennae one-third length of body. Legs and rostrum as in preceding stage.

Fourth stage nymph. (Plate VII, fig. 6.) Length 1.42 mm. Shape oval, dorsal surface brownish black. Fine light median dorsal line on prothorax, broadening into a dorsal median spot on meso- and metathorax and first abdominal segment. First two abdominal segments slightly lighter at lateral margins. Tubercles similar to those of preceding stage, glandular hairs becoming spine-like. Tubercles of head and thorax bearing several of these spine-like hairs. A spine-like hair anterior to each tubercle on pro- and mesothorax. Tubercles on lateral margins of abdomen each bearing two spine-like hairs and some

finer glandular hairs. Lateral margins of pro- and mesothorax prominently lobed. Lobes of mesothorax reaching second abdominal segment. Eyes prominent, reddish. Antennae white, slightly more than one-third length of body. Rostrum white tinged with brown, reaching third pair of legs. Legs white, tarsi tinged with brown.

Fifth stage nymph. (Plate VII, fig. 7.) Length 2.2 mm. Shape broadly oval. General color dark brown, almost black. Outer angles of prothoracic lobes with conspicuous light spot; median portion of mesothorax light; light band extending across metathorax, first abdominal segment and posterior portions of the mesothoracic lobes. A pair of prominent tubercles on dorsal surface of head and one in middle of vertex, a divided tubercle on apex of hood, one on the outer angle of margin of prothoracic lobe, one on either side of light spot on mesothorax, one on lateral margin of mesothoracic lobe, one on lateral margin of each abdominal segment beginning with the fourth, a pair on the median dorsal surface of the fifth and sixth abdominal segments. Each tubercle bears 3 or 4 spines. There is a pair of spines on median dorsal portion of second and eighth abdominal segments. On the lateral margin of the prothoracic lobe there are three spines anterior to the tubercle and two anterior to the tubercle on the mesothoracic lobe; a median pair on the mesothorax posterior to the hood. Eyes distinct, granular, dark brown, showing just beyond lobes of prothorax. Antennae white, about one-third length of body, last two segments bearing number of long fine hairs. Rostrum extending to middle pair of legs. Legs white, tip of tibia and tarsus suffused with light brown, each segment bearing several minute hairs.

Adult. **Corythucha spinulosa** (Plate VII, fig. 8).

Edmund H. Gibson, Trans. Amer. Ent. Soc. xliv, p. 79 (1918).

"Hood twice as high as median carina and noticeably longer. Height of hood equals about two-thirds the length of hood and not much greater than length of median carina. Median carina with two rows of areoles. Reticulation of hood large. Costal margins of elytra nearly straight. Spines on membranous margins normally long, not numerous on nervures. Size 4 mm. long, 2.5 mm. wide.

"Hood embrowned on top. Nervures of paranota yellow, with only trace of brown spots. Dark brown band across base and apex of elytra. Apical band slightly less in width than one-third length of elytra. Two or three large hyaline areoles in apical band and several partial hyaline.

Differs from *associata* Osb. & Dr., in having a lower hood, fewer spines on nervures, two rows of areoles in median carina and a narrower apical band across elytra. Distinguished from *cyrta* Parsh., in having crest of hood more acute and angulate and top from crest forward nearly straight.

Described from one female and three males collected by Dickerson and Weiss at Jamesburg, New Jersey, and in the Parshley collection and from one female and two males in the Weiss collection. Many other specimens from the same locality have been examined. Food plant of this species is wild cherry, *Prunus serotina.*"

Up to the present this species has been found only at Jamesburg in New Jersey and appears to be rather well distributed over a small wooded section in that locality.

EXPLANATION OF PLATE VII.

Corythucha spinulosa Gibson.

Fig. 1, cherry leaf showing feeding.
Fig. 2, egg.
Fig. 3, first stage nymph.
Fig. 4, second stage nymph.
Fig. 5, third stage nymph.
Fig. 6, fourth stage nymph.
Fig. 7, fifth stage nymph.
Fig. 8, adult.

New and Old West Indian and North American Chalcid-flies (Hym.).

By A. A. GIRAULT, Glenn Dale, Maryland.

GROTIUSOMYIA new genus.

Belongs to the Ophelinini. Habitus and structure of the Entedonini.

♀. Head (cephalic aspect) triangular, the antennae inserted at the ventral ends of the eyes, the scrobes forming a narrow, acutely pointed triangle; antennae 10-jointed, short and clavate, two very thin ring-joints, the club 2-jointed and obtuse at apex. Mandibles broad, at apex with twelve *equal,* minute teeth.

Pronotum distinct, of moderate size. Parapsidal furrows complete, much curved, narrow like a suture. Axillae a little advanced, with blunt apex. Scutellum simple.

Propodeum with a very strong median carina and a "complex" lateral one consisting of two carinae diverging at once from base or nearly, opening disto-laterad, the cephalic arm forming the cephalic margin of the propodeum and nearly against which is the moderate, oval-reniform spiracle; the oth-

er arm, the true lateral carina, runs disto-laterad toward the hind coxa and well mesad of the spiracle; it has a distinct, smooth sulcus along its lateral side. Abdomen sessile, flat above, its second segment occupying slightly less than half the surface, its caudal margin straight, the other segments short except 7.

Marginal vein a little longer than the submarginal, about thrice the length of the well developed stigmal, the latter somewhat shorter than the postmarginal. Tibial spurs of hind legs not enlarged, distinct.

Genotype: *Miotropsis nigricans* Howard.

1. **Grotiusomyia nigricans** (Howard).

♀. Length, 1.15 mm. Dark metallic blue, the wings hyaline, the venation pale, the antennae, tegulae and legs, golden brown except the hind coxae. Mandibles white, at apex narrowly reddish, broadly dusky at base. Head and thorax scaly punctate (that is scaly but the lines raised), the propodeum and the abdomen (except segment 2 entirely), scaly. Hind coxae above sculptured like the scutum. Bulla quadrate, dusky. Scape cylindrical, moderately long. Pedicel a little longer than wide, small. Funicle joints all distinctly wider than long, the distal two larger than the proximal two, the club about equally divided, the second joint smaller, 1 much wider than long. Scutellum with four bristles.

One female reared from larva of *Eudamus proteus*, St. Vincent, British West Indies (F. Watts). United States National Museum, the female on a tag, the head, a hind tibia and a fore wing on a slide.

2. **Grotiusomyia flavicornis** Girault, Psyche, xxiv, p. 95, 1917.

♀. The same but the mandibles only 7-dentate, the pedicel is infuscated, the propodeum and postscutellum glabrous not scaly. Funicle 1 quadrate. Otherwise the same.

Two females reared from a pyralid leaf-miner on oak, August 4, 1879, Washington, D. C.

Secundeisenia (Eiseniella) mexicana (Ashmead).

The postmarginal vein is distinct but very much shorter than the stigmal. Otherwise the species resembles a *Blastophaga*. Marginal vein somewhat shorter than the long stigmal. Antennae 11-jointed, the first funicle joint with a process.

Type in the U. S. National Museum examined.

Stomatoceras unipunctatipennis new species.

♀. Length, 2.35 mm. The red collar or prothorax is characteristic. Blood red, the following parts black: Head, antenna distad of funicle 2, scutum, parapsides, scutellum, axillae, abdomen except lower sides and venter, propodeum broadly along the meson and the middle part of the mesopleurum. Fore wings embrowned from the base of the bend of the submarginal vein to apex and with a perfectly round, rather small hyaline spot against the apex of the short stigmal vein; venation dark.

Funicle 1 a little longer than wide, 2 longest, twice longer than wide, shorter than the pedicel, 8 quadrate; club a little longer than the pedicel. Marginal vein somewhat less than twice the length of the postmarginal, the latter over twice that of the stigmal which is directed distad. Black teeth on hind femur along basal half. Cheeks caudad margined. Umbilicately punctate; mesopleurum cross-rugulose; apex of scutellum emarginate only; abdomen (except segment 2) scaly, 7 with obscure thimble-punctures, the last segment with a median carina. Propodeum with coarse, oblique rugae and a pair of median ones, all conspicuous.

One female, January 27, 1897, Berkeley, West Virginia (E. A. Schwarz).

Type: Catalogue No. 20678, United States National Museum, a female on a tag, antennae and fore wings on a slide.

Stomatoceras unipunctatipennis Girault **americensis** new variety.

♀. Like the typical form but a third larger, the abdomen entirely black except the base beneath, the pronotum black except the caudal margin laterad, the cephalic part of propleurum black, the upper and lower parts of metapleurum and the propodeum except disto-caudad.

One female, Camden County, New Jersey (W. J. Fox).

Type: Catalogue No. 20680, United States National Museum, the female on a tag.

Stomatoceras tenuicornis new species.

♀. Length, 4.00 mm. Black, the filiform antennae except scape (except at apex) and the club (except at base), knees very narrowly, tips of tibiae, tarsi and the extruded part of the ovipositor valves, blood reddish; also the middle coxae. Fore wing infuscated as in the preceding but instead of the round hyaline circle there is a hyaline stripe which reaches two-thirds the way across the wing.

Funicle 1 over twice longer than wide, a little over half the length of the very elongate pedicel which is a little longer than any funicle joint; funicle 2 longest, a third longer than 2, slightly longer than 3, 8 twice longer than wide; club subequal to funicle 3. Abdomen scaly

from the distal third of segment 2 (except the other segments broadly proximad); large punctures on 7 distinct. Propodeum rugose but with five half-complete "median" carinae at base, all well separated. As in the other species.

One female, Santa Rita Mountains, Arizona, May 21 (H. G. Hubbard).

Type: Catalogue No. 20681, United States National Museum, the females on a tag, a fore wing and an antenna on a slide.

Pleurotropis kansensis new species.[1]

♀. Similar to *quercicola* (Ashmead), but segment 2 of the abdomen is entirely glabrous and occupies but one-fourth of the surface, the scutum is uniformly sculptured and the petiole quadrate. Lateral carinae straight, long, the pair of median very close together.

One female, Onaga, Kansas (Crevecoeur).

Type: Catalogue No. 20694. United States National Museum, the female on a tag, the head on a slide.

Polycystus clypeatus new species.

Characterized by not having the clypeus advanced but its apex tridentate, the teeth subequal; moreover there is a very narrow, hairlike "tooth," longer than the others, between the third tooth and the sinus at lateral margin. *Syntomopus americanus* Ashmead has the clypeus tridentate, but the lateral teeth are very weak and short, the median one long and conspicuous. *Syntomopus affinis* Ashmead has the clypeus similarly armed.

♀. Length, 0.85 mm. Dark metallic green, the wings hyaline, the venation yellow; knees very broadly, tarsi and tips of tibiae white, the tibiae yellow; flagellum beneath suffused with yellow.

Antennae inserted below the middle of the face but above the ventral ends of the eyes, the scrobes inconspicuous; pedicel somewhat longer than wide at apex, longer than any funicle joint; 1 of funicle quadrate, 6 nearly twice wider than long; ring-joints (2) short, a little unequal. Mandibles 4-dentate. Head and thorax densely scalypunctate.

Pronotum transverse. Parapsidal furrows about half complete. Axillae separated. Propodeum neckless, tricarinate, the carinae joining around the caudal margin, the cephalic margin to the spiracle foveate, the foveæ bounded by carinae, the spiracle elliptical; a spiracular sulcus directly from the spiracle and along the lateral side

of the lateral carina. Propodeum and petiole scaly, the latter about as long as the hind coxae.

Abdomen smaller than the thorax, slightly scaly toward apex, widest at apex of segment 2, flat above, kneeled beneath; segment 2 occupying over a third of the surface, with a small, distinct incision at meson caudad; other segments much wider than long; the ovipositor valves extruded a little.

Hind tibial spur slender. Postmarginal vein long, a little shorter than the marginal, distinctly longer than the elongate stigmal.

One female reared from a leaf-miner on corn, St. Vincent, British West Indies (F. Watts).

Type: Catalogue No. 20682, United States National Museum, the female being on a tag; hind legs, the head and a fore wing on a slide.

Mosolelaps cyaneiventris Ashmead. Genotype.

One ring-joint, seven funicle, three club, the antennae 13-jointed. Female. From the type.

Sycophila incerta Ashmead.

The scutellum is flat and quite as in *Kocbelea* but the postmarginal vein is much shorter than the stigmal, yet distinct. Mandibles tridentate. Propodeum plane, distinct, wider than long. Funicle joints all wider than long, shorter than the pedicel. *Two* ring-joints, contrary to the description. The abdomen bears four brown cross-stripes, the first at the apex of segment 2; body honey yellow. Type seen.

Many females reared from *Ficus laurina,* Barbadoes, West Indies (F. Watts).

Idarnes carme Walker. Genotype.

The antennae are 11-jointed with one ring-joint, the club 3-jointed and with a slight nipple at apex. Mandibles with two equal acute teeth. Ovipositor about twice the length of the body. Scape yellowish except above. The original description is otherwise about correct. There is no minute fourth club-joint (or a nipple which has the appearance of being articulated).

Reared, together with a *Blastophaga,* from *Ficus laurina,* Barbadoes, British West Indies (F. Watts). Compared with specimens in the United States National Museum. A synonym is my *Idarnomorpha.*

Bruchobius laticeps Crawford.

♀. Length, 2.30 mm. Short, robust. Differs from the description of the genotype of *Metastenoides* in that the postmarginal vein is a lit-

tle longer than the short marginal, the latter subequal to the stigmal; the spiracular sulcus is not present, the spiracle reniform and rather stouter; neck of propodeum prominent, the abdomen very shortly petiolate, the petiole vertical and hidden; segment 2 of the abdomen occupies somewhat over a third of the surface (its caudal margin straight); all coxae metallic; otherwise the same; distal half of hind tibiae white; funicle 1 nearly twice the length of the pedicel; ring-joints increasing in size; clypeus striate; one hind tibial spur short; parapsidal furrows three-fourths complete.

♂. Femora more or less metallic, the abdomen with a large white blotch at base (beneath and above), two nearly equal ring-joints, funicle 1 a half longer than wide, a little shorter than 6, longer than the short pedicel, 2 longest, about twice longer than wide. Funicle and club darker.

From several pairs associated with cowpea weevils at College Station, Texas (Paddock). The genus belongs to the Miscogasteridae and is closely allied with my *Metastenoides,* if not identical with it.

Pseudomphale eudami new species.

♀. Differs from *cupreus* in that the sculptured area on segment 2 of the abdomen is twice longer and mostly of fine punctures, the lateral grooves of the scutellum meet medially.

From *nigroaeneus* in that segment 2 is punctate, the abdominal petiole is only weakly tricarinate.

From *apantelivorus* in that the large area containing the spiracle is not wholly glabrous but coarsely scaly at its margins, the abdomen is shorter, the prepectus subglabrous (scaly reticulated, *not* punctured, in the other) and the sculpture of abdomen 2 coarse (in the other very fine and of minute punctures as in *microgaster.*)

From *cockerelli* (which is the same as *apantelivorus* but differs in having the coarse sculpture on the abdomen), in that its prepectus is delicately scaly.

Of the continental North American fauna, it runs to *sardus* Walker, but abdomen 2 in that species bears scaly sculpture as it does in all the varieties and allies of that species. The species *producta* Ashmead has segment 2 of the abdomen punctured back to the middle or more. Funicle joints subequal, short, oval, a little shorter than the pedicel and than club 1.

♂. Scape compressed, its distal half metallic above, the four funicle joints as in the female, more hairy, longer than the pedicel, shorter than the club.

Three pairs reared from the larva of *Eudamus proteus,* St. Vincent, British West Indies (F. Watts).

Types: Catalogue No. 20662, United States National Museum, two males, three females on tags. Types of the named species examined or else specimens.

The table of species in the Proc. U. S. National Museum, 40, 1911, p. 446, is faulty in that the coloration of the femora and tibiae is not mentioned and the sculpture of the head is used; I have been able to see no real difference in respect to the latter, though I have examined every species concerned besides all those from North America. However, *euplectri* has the space inclosed by the V-shaped suture in front of the ocelli subglabrous; in the genotype this is glabrous.

Closterocerus utahensis Crawford (**californicus** Girault).

One female from *Symydobius chrysolepis* on *Quercus chrysolepis*, Alpine, California, April 30, 1916 (A. F. Swain).

Omphalchrysocharis petiolatus new species.

♀. Similar to *orientalis* but the mandibles only bidentate, the petiole nearly twice longer than wide and with lateral carinae (its surface scaly), the scutellum with a short sulcus at base, the propodeum with irregular carinae along its meson broadly. Funicle joints nearly twice longer than wide, subequal, each a little longer than the pedicel.

♂. Scape dilated, black along its dorsal edge, otherwise pale.

Three pairs reared from an Oscinid on daisy, March 5, 1890 (Washington, D. C.).

Types: Catalogue No. 20665, United States National Museum, two males, three females on tags, the head of each sex on a slide.

Arthrolytus aeneoviridis Girault.

One female, Phoenix, Arizona, from *Bucculatrix thurberiella* on cotton (C. K. Wildermuth).

Scudder's Tertiary Insects of North America.

A few copies of Volume XIII of the final reports of the Hayden Survey, entitled "The Tertiary Insects of North America," have been recently acquired by the United States Geological Survey, Department of the Interior, and may be obtained on application to the Director of the U. S. Geological Survey, Washington, D. C. This monograph is of interest to paleontologists. It contains 734 pages and 28 plates.

A new Species of Eupogonius (Coleoptera, Cerambycidae) from Pennsylvania.

By Josef N. Knull, Bureau of Zoology, Harrisburg, Pennsylvania.

As far as I know, five species of Eupogonius have been described from the United States. Four of these, *E. tomentosus* Hald., *E. vestitus* Say, *E. pubescens* Lec. and *E. subarmatus* Lec. are found in the eastern part of our territory, while *E. fulvovestitus* Schaeffer was described from Texas.

Eupogonius fraxini n. sp.

Dark brown clothed with irregular patches of closely appressed fulvous hairs, intermixed with erect black and yellow hairs. Head irregularly clothed with fulvous hairs, densely and deeply punctured, each puncture bearing an erect black hair. Eyes black, prominent, coarsely granulate and fringed with short fulvous hairs along the margins. Female antennae shorter than body, male antennae extending beyond the tips of the elytra, dark brown, sparsely clothed with fulvous hairs, coarsely and densely punctured toward the base, decreasing toward the apex, each puncture bearing a long flying black hair, third joint longer than the first and second joints taken together, fourth joint as long as the third, fifth joint one-half as long as the fourth, joints six to eleven gradually decreasing in length.

Thorax narrower than the elytra, armed on each side with a rather prominent obtuse spine, clothed with irregular patches of closely appressed fulvous hairs, deeply and densely punctured on dorsal surface and along the sides, each puncture bearing an erect black hair.

Elytra broader than the thorax, densely clothed with irregular patches of fulvous hairs, showing the ground color in small shiny areas, irregularly coarsely and deeply punctured, finer toward the base; each puncture containing an erect black or yellow hair, sides parallel for the anterior two-thirds and gradually tapering to rounded apices.

Ventral surface convex, dark brown, covered with a uniform fulvous pubescence, segments fringed with fulvous hairs, sparsely and lightly punctate, punctures becoming more numerous along the lateral margin and on the fifth ventral segment, each puncture containing a long light-brown hair.

Femora dark-brown, tibiae and tarsi much paler, legs clothed with fulvous pubescence intermixed with long light-brown hairs. Length, 8 mm.; width, 3 mm.

Described from two males and two females chopped from

the bark of a dead black ash (*Fraxinus nigra* Marsh.) at Hummelstown, Pennsylvania, July 21, 1917. *Type*: A male in the author's collection.

The larvae had worked through the bark and transformed to the adult stage without entering the sapwood.

I believe that Mr. F. C. Craighead took the same species from an ash tree at Great Falls, Virginia, in 1916.

New North American Diptera (Scathophagidae).

By E. T. Cresson, Jr., Academy of Natural Sciences of Philadelphia.

Orthacheta amoena new species.

♂. Black; frontalia, antennae, halteres, lateral margins of abdomen, legs except hind tarsi, tawny. Face, cheeks, palpi, squamae, and fore coxae, white. Wings brownish with decided intensification along costa. Opaque; frontal orbits, occiput, ocellar tubercle, thorax except mesonotum, abdomen except dorsum, cinereous. Mesonotum brownish with fine dorso-central black stripes; scutellum and abdomen also brownish. All bristles black.

Slender; head as broad as thorax. Frons nearly .3 width of head; orbits parallel; three proclinate frontals. Antennae .8 length of face; third joint 3 times as long as second with acutely prominent apical angle; arista micro-plumose. Palpi nearly as long as horny proboscis. Oral margin, each side, with 2-3 bristles besides the vibrissa. Thoracic chaetotaxy: D. C. 2:3, Hum. 1-2, Presut. 1, Np. 2, Sa. 2, Pa. 2, Ppl. 2, Stigma 1, Mpl. 2-3, Spl. 3. Scutellum triangular, narrowly truncate with 4 long bristles; the apical pair cruciate and at extreme apex. Abdomen 1.5 times as long as broad, narrower than thorax; segments 2-4 each with a long, erect bristle on apical lateral margins; 5-6 each with 4 erect apical marginal bristles; lobes of fifth ventral, suspended, twice as long as broad, with roundly pointed apices, sparsely pilose. Legs long and slender, especially the femora. Chaetotaxy: Fore femora with post. fl. and ext. series long and slender; fore tibiae with 2 ant. ext., 1 post. ext. and fl.; middle femora with 1 ant. fl., 3-4 ant., 2 subap. post., 2-3 fine, long post. fl.; middle tibiae with 1 ant. fl., 2 ant. ext., 2 long post. ext., 1 post. fl.; hind femora with 3 fine long fl., 1-2 ant. fl., 6 ant. ext.; hind tibiae with 1 ant. fl., 3 ant. ext., 3 post. ext. Wings long and narrow; costa without spine at first; veins 3-4 curved and parallel; penult. and ult. of fourth subequal; ult. of fifth .5 as long as post. c. v.; anal vein attaining margin. Length.—6 mm.

Type.— ♂ ; Swarthmore, Pennsylvania, April 10, 1910 (E. T. Cresson, Jr.; sweeping over grass), [A. N. S. P. No. 6176].

A female, Ithaca, New York, April 24 [Cornell] seems conspecific with the above male and is similar in most respects, but with the usual augmentation in the chaetotaxy; also the wings are more hyaline, tinged with yellow instead of brown; apex of abdomen pale but not flattened; second antennal joint pale at apex.

Cordilura vierecki new species.

♀. Black; frontalia, second antennal joint above, halteres, fore femora apically, fore tibiae and tarsi, hind legs including tarsi, tawny; face, cheeks, palpi, squamae, whitish yellow. Wings yellowish with pale veins. Pile of ventral surfaces pale. Opaque, yellowish pruinose.

Frons .3 width of head; orbits parallel; bristles very long. Face in profile retreating. Oral margin with long bristles. Occiput strongly swollen below. Third antennal joint distinctly angular at apex; arista plumose to apex. Mesonotal bristles very long, also the four on scutellum. Fore femora, with distinct bristles in post. extensor and ant. extensor series; three or more long ones in ant. flexor series of hind femora; middle and hind tibiae with three long bristles in each ant. and post. extensor series. Penultimate section of fourth vein .8 as long as ultimate. Apical segments of abdomen laterally compressed. Length—8 mm.

Type.— ♀ ; Beulah, New Mexico, June 28, 1902 (on top of range; H. L. Viereck), [A. N. S. No. 6177]. *Paratypes.*— 2 ♀ ; topotypical.

I have also 3 females from Top of Las Vegas Range, New Mexico, June 28, 1902, which are probably part of the typical series.

Apparently closely allied to *confusa* Lw., but very different in color pattern.

Cordilura amans new species.

Entirely yellow except ocellar spot, bristles and the bare, or microplumose, arista, black. Wings yellowish, with pale veins. All bristles strong with apical scutellar bristles nearly as strong as the lateral ones. Third antennal joint twice as long as second, with distinct apical angle. Hind tibiae with 2 post. extensors. Penult. section of vein 4 about .5 as long as ult. Length—5 mm.

Type.— ♂ ; Redwood Canyon, Marin County, California, May 17, 1908 (E. T. Cresson, Jr.), [A. N. S. No. 6178].

Cordilura adrogans new species.

♂. Black; frons anteriorly, apex of second antennal joint, halteres, palpi, fore tibiae, tawny; face and cheeks white. Wings brownish, more intense along costa and at apex; veins black. Mesonotum and abdomen shining; frons, occiput, pleura, and metanotum, more or less hoary.

Frons .25 as broad as head, slightly convex; orbits converging; occiput moderately convex. Oral margin with long bristles. Third antennal joint with sharp apical angle; arista plumose basally. Pile of ventral surfaces pale. Dorsocentrals 2:3, and 2 humerals, very strong. Apical bristles of scutellum small and cruciate; lateral ones strong. Abdomen cylindrical with lateral marginal bristles strong; lobes of fifth ventral acute apically, short pilose. Hypopygium large. Femora stout; all tibial bristles well developed; hind tibiae with 3-4 post. extensors. Penult. section of vein 4 about .6 as long as ult.; veins 3-4 curving and parallel. Length—6 mm.

Type.— ♂ ; Mesa Grande, Sonoma County, California, June, 1908 (P. C. Baumberger), [A. N. S. No. 6179].

Parallelomma nudicornis new species.

♂. Black; head except occiput above, ocellar spot, frontal orbits, pleura except an elongate spot beneath wings, and legs, yellow. Shining except frontalia and face. Wings hyaline.

Slender species with nearly spherical head. Frons .3 width of head; orbits parallel. Third antennal joint 1.5 as long as second, with rounded apex; arista micro-pubescent. All bristles weak; only one d. c. near posterior margin, and one weak humeral. Scutellum with minute approximate apical, and strong lateral, bristles. Second abdominal segment with long lateral marginal bristles; segments 3-5 with long bristles only at lateral apical margins. Fifth ventral lobes very small. Bristles of legs very weak; no post. extensors on hind tibiae. Anterior c. v. at middle of discal. Long 3.5 mm.

Type.— ♂ ; Berkeley Hills, Alameda County, California, March 22, 1908 (E. T. Cresson, Jr.), [A. N. S. No. 6181].

I hardly think this can be *inermis* Lw., which was described from New Hampshire, although I have seen a specimen of *nudicornis* from British Columbia.

Parallelomma dimidiata new species.

♂. Pale yellow; ocellar spot, occiput above, mesonotum including upper half of humeri and of notopleura, scutellum, metanotum and abdomen except hypopygium, shining black. Metanotum and pleura with more or less hoary reflections. Bristles black; most pile pale, but

on all tibiae and tarsi dark and short although longer and more erect on middle tibiae beneath. Dorsocentrals except posterior one, and humeral bristles, weak and pale. Wings brownish but more intense along costa and veins.

Slender species, with nearly spherical head. Frons .25 width of head; orbits converging. Scutellum with well developed lateral and minute cruciate apical, bristles. Lobes of fifth ventral large, broad with narrowly rounded apices. Penult. section of fourth vein 1.25 as long as post. c. v. and .3 as long as ult. section. Length—7 mm.

Type.— ♂ ; Philadelphia, Pennsylvania, June 19, 1912 [Cornell University Collection]. *Paratype*.—1 ♂ ; topotypical.

Very similar to my determination of *C. pleuritica* Lw., but here the pleura are pale without black area beneath the wings, and the humeri are yellow on the lower half. The middle tibiae with moderately long bristles and erect black flexor pile. This may be *C. munda* Lw. and is probably closely allied to the European *albipes* Fall.

Parallelomma vicina new species.

♂. Similar to *dimindiata* but the mesonotum with a broad, median pale stripe which does not attain the base of the scutellum. Pleura with a dark area beneath wings which includes the metanotum. Apices of hind femora dark; pile on tibiae pale, very long and erect on flexor of middle tibiae. Hypopygium dark. Wings infuscated at tips, especially noticeable along veins 2, 3, 4. Cross veins narrowly clouded. Scutellum without any trace of apical bristles. Lobes of fifth ventral broad and broadly rounded at apices. Length—6 mm.

♀. Similar but with no characteristic pile on tibiae; bristles of fore legs strong; hind tibiae with 2 post. extensors.

Type.— ♂ ; Swarthmore, Pennsylvania, April 29, 1906 (E. T. Cresson, Jr.), [A. N. S. P. No. 6180]. *Paratypes*.—2 ♂, 4 ♀ ; topotypical, April 29 to May 28.

Very similar to my determination of *gracilipes* Lw., but that species has no dark pleural spot and the pale mesonotal stripe continues onto the scutellum; the lobes of the fifth ventral are very broadly truncate with emarginated apices.

Scathophaga nigrolanata new species.

♂. Black; frontalia, face, cheeks, palpi, halteres, legs except fore femora laterally, base of wings, apex of abdomen and of segments,

pale brown to yellow; second antennal joint brown. Wings hyaline; ant. c. v. dark but not clouded. Head, thorax and abdomen more or less opaque, brownish gray, becoming lighter below. Legs more shining. All pile and bristles black. Pile of thorax, abdomen, and legs, very long and wooly. Mesonotum indistinctly vittate. Arista bare. Six frontal bristles; 5 or more fronto-orbitals in a series diminishing to near line of base of antennae. Palpi as long as proboscis, somewhat clavate. Cheeks .6 height of eyes, with no distinct bristle. Acrostichals not differentiated from the pile; d. c. 2:3 with the anterior one scarcely discernible; humeral bristle indistinct. Scutellum convex, triangular, acute, with 4 bristles. Femora without distinct bristles; fore tibiae with a hair-like apical extensor; middle tibiae with 2-3 ant. ext., 3 post. ext., 2 post. fl.; hind tibiae with 2 ant. ext., 1-2 post. ext., and a long hair-like preapical extensor. Veins 3 and 4 parallel. Length—7-10 mm.

Type.— ♂ ; West Coast of Greenland, 1891 (Mengel and Hughes, on the Peary Expedition), [A. N. S. No. 6182]. *Paratypes.*—3 ♂ ; topotypical.

This form differs from the other allied arctic species in being larger, darker in color of the pollinose dusting and pile; the latter is noticeably long and wooly, much longer than in *stercoraria*.

Scathophaga nigrolimbata new species.

♂. Yellow with incisures of abdomen black. Head opaque; thorax and abdomen more or less shining. All bristles and setulae, pile of abdominal dorsum, and apical half of hind femora, black; that of occiput, pleura, venter, fore and middle femora, pale. Wings yellowish with pale veins and no clouds over c. vs.

Frons with 6 frontals and 3 orbitals. Arista plumose. Cheeks .25 height of eyes. Acrostichals seriated posteriorly; d. c. 2:3; other bristles normal. Scutellum semi-circular, with 4 bristles. Femoral bristles indistinct. Fore tibiae with 2 ext., 1 post., all hair-like; middle tibiae with 1 ant. ext., 1 post. ext., all weak; hind tibiae with 3-4 ant. ext., 1 apical ext., 2 post. ext. Wings with veins 3, 4 parallel. Length—6 mm.

♀. Similar with bristles stronger. Abdomen darker, due probably to decomposition.

Type.— ♂ ; Beaverkill, Sullivan County, New York, August 12, 1909 (E. T. Cresson, Jr.), [A. N. S. No. 6183]. *Allotype.*— ♀ ; topotypical.

This may be *pallida* Walker, but there is no curving of the post. c. v. as described by Walker.

A Second Mycetophila with Dung-bearing Larva (Diptera; Mycetophilidae).

By Frederick Knab and R. H. Van Zwaluwenburg,
Bureau of Entomology.

(Plate VIII)

From the majority of published statements one gains the impression that the larvæ of the numerous species of the genus *Mycetophila* are very much alike in appearance and habits. They are described as elongate white fleshy larvæ with a darker chitinous head. They are stated to occur more or less gregariously in fungi, either burrowing in their interior or living between the lamellæ. Larvæ of this genus living singly and exposed, upon the foliage of higher plants, appear to have been recorded but once.* We are able to make known a second species of such habits, discovered in Porto Rico by the junior author. We initiate the subject with a brief synopsis of the principal biological data brought out by Doctor Holmgren in the paper just mentioned.

These highly remarkable larvæ were discovered by the third Nordenskioeld expedition in the rain-forest region of Peru and Bolivia. The larvæ occurred singly upon the leaves of bamboo (*Chusquea* spp.) and carried upon their backs a black shell; they so closely simulated in appearance a small gastropod, such as *Ancylus*, that at first they were mistaken for such. The larva is short and stout and the protecting shell carried upon its dorsum is constructed of its own excrement and shows a series of rings or creases indicating the successively added layers of material (Plate VIII, fig. 4). That the shell has a protective function is shown by the fact that when the larva is touched at one side it draws the shell in that direction. The larvæ occurred but sparingly and crept about slowly on the bamboo leaves in search of food. Forward movement was accomplished by successive muscular contractions along the ventral surface in the manner of a gastropod; but the

* Holmgren, Nils, Monographische Bearbeitung einer schalentragenden Mycetophilidenlarve (*Mycetophila ancyliformans* n. sp.). Zeitschr. f. wissensch, Zool., vol. 88 pp. 1-77, pls. 1-5 (1907).

larva can only progress upon a moist surface and this is provided by the secretion from the enormously developed salivary glands. A shining silky trail remains after the larva has moved on and the secretion dried. The larva feeds upon fungi occurring upon the surface of the bamboo leaves, mowing these off with its peculiar serrate mandibles (Plate VIII, fig. 5). Holmgren had great difficulty in rearing the larvæ, partly from inability to maintain suitable conditions, but especially from the frequent infestation of the larvæ with small parasitic dipterous larvæ. Finally Holmgren succeeded in rearing a single imago and this proved to belong to the genus *Mycetophila* and was described as a new species under the name *M. ancyliformans*. The larva when about to pupate threw off its shell and constructed a cocoon of salivary threads, consisting of an outer layer of large meshes and an inner closely woven one which rather closely covered the pupa within.

The larvæ found by the junior author in Porto Rico were very similar to those discovered by Holmgren; they were dirty white and, like them, carried a black shell formed of their own excrement. The larvæ were first found in October, 1916, near the town of Aibonito, on the edge of the woods and at an altitude of about 2000 feet. They occurred upon the leaves of Guamá (*Inga laurina*) and extensive search yielded only five of them, the largest one about four millimeters in length. A further careful search in the same locality recently (June, 1917) was unsuccessful. Very recently (July, 1917) larvæ of the same kind were found in considerable numbers on the under surfaces of leaves of "poma rosa" (*Eugenia jambosa* L.) in a narrow valley near Mayaguez. A single male was reared from the larvæ found at Aibonito, and another male from the larvæ found near Mayaguez; through these two specimens the specific unity of all the larvæ is established.

The dung-covering of the larva consists of a dull blackish, rather rough mass of homogeneous material. Its shape differs more or less in our specimens from that described and figured

by Holmgren for his species. The resemblance to a snail-shell is usually less complete, although the mass is obliquely conical, the apex close to one end, and concentric creases are present. Some of our specimens are much more flattened and rise but gradually toward the apex, while the creases are less numerous. Others of our specimens (compare, Plate VIII, our figs. 2 and 3 with fig. 4 from Holmgren) do not slope regularly from the apex to the sides; instead there is a central strongly conical portion, separated by a deep crease from an outer flattened portion. In short, while the principle of construction is the same, there is considerable variation culminating in specimens closely approaching Holmgren's in shape

The larva before pupation spun a loose-meshed cocoon beneath the black dung-cap, which ultimately rested on top of the cocoon. As in the species described by Holmgren, the cocoon consists of wide, irregular meshes of white glistening threads secreted from the salivary glands. There is an outer network of a few very coarse threads and these are connected and here and there drawn toward each other by finer threads. Inside of this outer very open meshwork is a cocoon of smaller meshes and finer threads, a considerable space intervening between the two, but occasional threads connecting them. The meshes of this inner cocoon are still very open and allow the pupa within to be plainly seen. This inner cocoon again consists of coarser and finer threads, the former approximately corresponding to the finer threads of the outer cocoon. The coarser threads for the most part run around the cocoon transversely at rather regular intervals, while the finer threads run mostly lengthwise and bind together the transverse threads. The entire structure is fastened to the leaf-surface. On top of the cocoon, as already mentioned, usually rests the shell or dung-cover of the larva (Plate VIII, figs. 2, 3); in other cocoons the dung-cover has been cast off. The pupal period lasts four days. The description of the imago follows.

Mycetophila merdigera, n. sp. (Pl. VIII, fig. 1).

♂. Pale ocher-yellow, the dorsum of the abdomen with the apices of the segments extensively marked with brown.

Head prominent, yellow, the frons evenly convex, nearly as long as broad, clothed rather densely with short, coarse, pale shining hairs; ocelli two, large and distinct, close to ocular margin. Eyes very shortly hairy. Antennæ slightly longer than the head and thorax together, yellow at the base, shading to black beyond the fifth joint; fifth joint about twice as long as wide.

Mesonotum moderately convex, not prominent anteriorly, ocher-yellow, opaque, slightly pollinose, clothed with shining rather short hairs. Scutellum concolorous, with four long marginal bristles, the middle pair slightly longer than the outer ones. Postnotum brownish. Pleuræ pale blotched with brown.

Abdomen dorsally dull ocher yellow and clothed with coarse and rather sparse black hairs, the segments distally marked with blackish, on the second segment all but a median triangle the apex of which reaches its posterior margin; on the succeeding segments the dark color is less extensive, becoming indefinite on the distal ones. Venter wholly yellow.

Coxæ very pale, all three pairs with a few coarse dark bristles distally. Femora pale yellow, the hind pair brown at extreme apex and with a few long bristles. Tibiæ pale at base, tinged with green and becoming darker toward apices; middle and hind pairs with three rows of long black bristles on extensor surfaces; middle pair with three bristles on flexor surface, the proximal one of which is much shorter than the others; front tibiæ shorter than first tarsal joint (20:24), the spur slightly shorter than the tibia; hind tibiæ apically with a comb of yellow bristles on inner side, the longest spur nearly equal to first tarsal joint. Tarsi green, the crowded black setulæ causing them to appear blackish toward apices; hind tarsi with the first joint distinctly shorter than the succeeding ones together (24:31).

Wing uniformly tinged with greyish yellow, unspotted; veins strong, brownish yellow; petiole of medial fork very short, not quite equal to the R-M cross-vein; base of cubital fork about as near wing-base as the latter. Halteres pale.

Length: Body about 3 mm., wing 2.5 mm.

Porto Rico: Aibonito, 26 October, 1916, one male reared from larva found on *Inga laurina* (R. H. Van Zwaluwenburg); Mayaguez, 9 July, 1917, one male reared from larva from *Eugenia jambosa* L. (Van Zwaluwenburg).

Type: Cat. No. 21535, United States National Museum.

This species is closely related to *Mycetophila ancyliformans* Holmgren, and also to *M. insipiens* Williston (Trans. Ent. Soc. London, 1896, p. 264) from the island of St. Vincent.

The latter will probably prove to have similar larval habits. *Mycetophila merdigera,* according to the table of Johannsen (Fungus gnats of No. Amer., Part IV, 1912, p. 84) falls together with *M. exstincta* Loew from the eastern United States; perhaps this last species also will prove to have a similar life-history and our collectors should watch for these very remarkable larvæ.

In conclusion attention must be called to the existence of dung-bearing larvæ in the closely related genus *Epicypta.* Such larvæ were recorded by Bremi* and by Perris** as early as 1846 and 1847. The latter gives a detailed and very interesting account of the early stages of *Epicypta scatophora* (Perris); Osten Sacken is of the opinion that Bremi had the same species under observation. These larvæ feed upon fungi occurring upon dead wood and cover themselves much more completely with their own dung. They finally pupate within an urn-shaped cocoon of the same material.

EXPLANATION OF PLATE VIII.

Mycetophila merdigera Knab and Van Zwal., n. sp.
(Photographs by J. H. Paine.)

1. Adult male. 2. Cocoon, top view. 3. Cocoon, side view.

Mycetophila ancyliformans Holmgr.
(After Holmgren.)

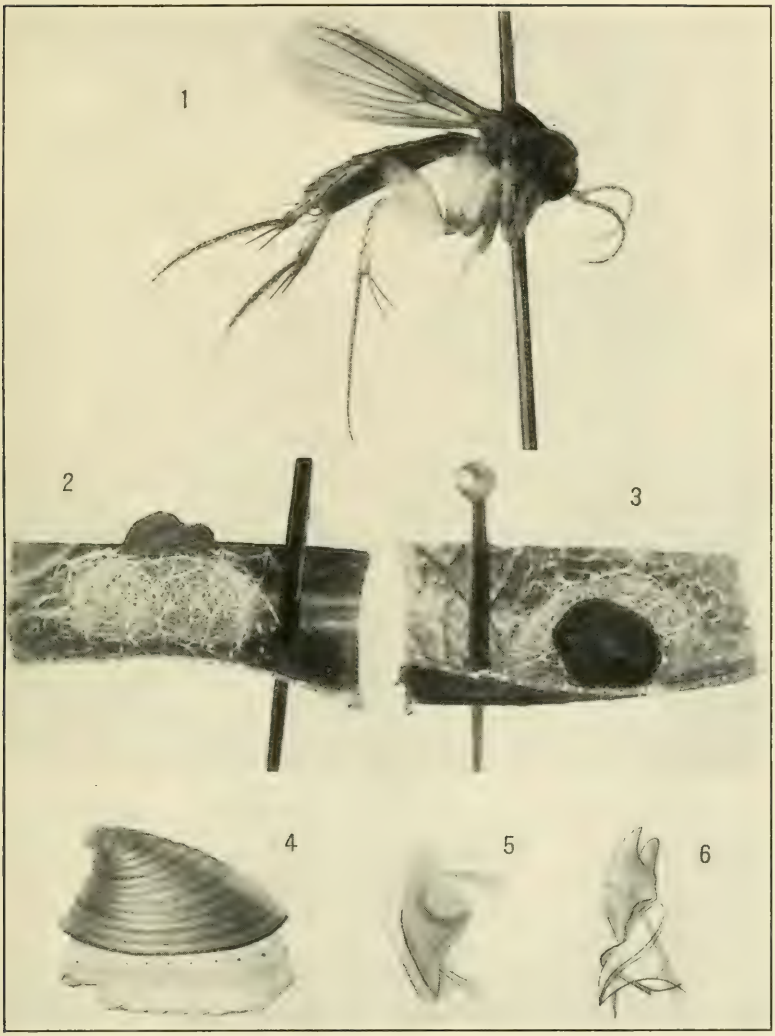
4. Larva, lateral view. 5. Mandible of larva. 6. Maxilla of larva.

Beetle, Hippomelas sphenicus, Prey of Wasp (Col.).

While collecting on the desert near Barstow about May 15, 1917, a large black-bodied, yellow-winged wasp was taken in my net. The wasp was found to be carrying a small specimen of *Hippomelas sphenicus* LeConte. This was remarkable, for *H. sphenicus* has never been reported from California. The wasp may have carried it from Arizona, a distance of about 140 miles, although that point is debatable. The size of the beetle very closely approximated that of the wasp, which was a very large specimen. It is a well-known fact that wasps collect and store their nests with various Coleoptera; specimens of *Hippomelas californicus* Horn in my collection, taken by Dr. F. E. Blaisdell in 1885, were found in a wasps' nest at Poway, San Diego County.—RICHARD T. GARNETT, Oakland, California.

*Isis von Oken, vol. 39, 1846, p. 169.

**Notes pour servir a l'histoire des métamorphoses de diverses espèces de Diptères. 1. Notice sur une larve de *Mycetophila* qui se couvre de ses excréments. Ann. Soc. Ent. France, 2 Ser., vol. 7, pp. 51-61, pl. 3, no. 1, figs. 1-13 (1847).



1-3, MYCETOPHILA MERDIGERA N. SP.;
4-6, M. ANCYLIFORMANS HOLMG.—KNAB AND VAN ZWALUWENBURG.

Data Concerning Flies that Frequent Privy Vaults in Montana (Dip.).

By R. R. Parker, Bozeman, Montana.[1]

As a part of the fly investigations conducted by the Montana State Board of Entomology at Laurel, Montana, during the season of 1914, experiments were carried on to obtain data concerning the species of flies frequenting privy vaults. Local conditions were discussed in the First Biennial Report of the Board, pages 36 to 50.

The most detailed results were obtained from a trap constructed to cover the entire back of a privy, the vault of which was open in the rear. The excavation was about three feet deep. The seats were uncovered and the door always open. After the trap was in place the flies had ingress by means of the doorway and the open seats and could escape either by the reverse course or by the trap opening in the rear of the vault. In the latter case they were captured. The results, therefore, showed the species present and their comparative abundance, but not the total number of flies entering the vault.

The flies for examination were captured in small Hodge traps placed above holes bored through the board forming the top of the large trap. These traps were collected and new ones substituted each day except Sunday, the catches for Saturday and Sunday being counted as one. The experiment was continued for 32 days, from July 20 to August 21. An accurate record was kept of the number of males and females of each species. At the conclusion of the experiment a large number of dead flies were removed from the large trap, but owing to their poor condition it was impossible to separate the males and females and in the genera *Calliphora, Lucilia, Fannia* and *Sarcophaga* specific determinations were not attempted. The results are shown in the accompanying table.

The total catch was 9676 flies,—8330 from the Hodge traps and 1346 from the large trap. The number of species included was 26,—Muscidae, 13; Anthomyidae, 4; Sarcophagidae, 3; Syrphidae, 2; Tachinidae, 1; Culicidae, 2; and Ortalidae, 1. The reader should consult the table for the species totals and species percentages of the total catch.

The data show one fact that is common to all the species, namely, that the females greatly predominate. This is especially apparent in *Lucilia sericata* (Meigen) and *L. caesar* (Linnaeus), the former showing a ratio of 1 male to 678 fe-

[1]Contribution from the Laboratory of the Montana State Board of Entomology, State College, Bozeman, Mont.

males, and the latter only females. It is interesting to note this high percentage of females even in species that do not breed in excrement. *Musca domestica* females were about three times as numerous as males, 564 to 197. The same relationship was found to hold good when flies were trapped out-of-doors with human excrement for bait, females being in that instance about four times as numerous as males. I have no data to show the comparative abundance of the two sexes in houses, but it is apparent that as a seeker of filth the female house fly is potentially more dangerous to the human species than the male. For this reason any bait that will attract more females than males should be considered more efficient than one which will attract an equal number of both sexes. Several baits were tried with this in view and a combination of beer and oatmeal was found the most effective.

TABLE GIVING DATA CONCERNING FLIES CAPTURED IN PRIVY TRAP EXPERIMENT AT LAUREL, MONTANA, JULY 20 TO AUGUST 21, 1914.

	Hodge Traps			Trap Cleanings	Species Total	Species Per Cent of Total Catch
	Males	Females	Total			
Musca domestica	197	564	761	113	874	9.03
Muscina stabulans	274	1078	1352	222	1574	16.27
M. assimilis	0	1	1	0	1	.01
Lucilia sericata	1	678	679	345	1145	11.83
L. caesar	0	120	120			
L. sylvarum	0	1	1			
Phormia regina	17	46	63	1	64	.66
P. terraenovae	0	2	2	.....	2	.02
Calliphora erythrocephala	19	107	126	30	156	1.61
C. coloradensis						
C. latifrons						
Stomoxys calcitrans	0	1	1	0	1	.01
Fannia scalaris	1609	2949	4558	509	5067	52.37
F. canicularis						
F. sp.						
Ophyra leucostoma	59	319	378	0	378	3.91
Myospila metabunda	2	8	10	0	10	.10
Ravinia peniculata	0	1	1	0	1	.01
Sarcophaga haemorrhoidalis	1	5	6	8	47	.49
S. cooleyi	1	32	33			
Anacampta latiuscula	0	4	4	0	4	.04
Eristalis tenax	0	5	5	34	39	.40
Syritta pipiens	0	82	82	84	166	1.72
Culex tarsalis	....	.....	137	0	137	1.42
Culiseta inornatus	....	.....	9	0	9	.09
Undetermined Tachinidae	....	.....	1	0	1	.01
TOTALS	....	.....	8330	1346	9676	.....

From the standpoint of numbers, the comparatively small representation of *Musca domestica* was most interesting. It constituted but 9.03 per cent. of the total catch. *Muscina stabulans* (Fallen) was unexpectedly abundant (16.27 per cent. of the total). This is a fact of some importance because there are seasons of the year when this fly is almost the only one found in houses. The same applies to *Phormia terraenovae* Desvoidy, which is one of the first flies found in houses in the spring, preceding the species just mentioned. The observations concerning these two species were made under rural conditions. These flies, however, together with *Phormia regina* (Meigen) and species of *Calliphora,* which appear later in the season, do not seem to frequent food to any great extent when in-doors, but are most commonly seen on the windows. The species of *Fannia,* of which *F. scalaris* Fabricius was predominant, were the most abundant of the privy flies, possibly because the species just noted is such a prolific breeder in latrines. The two species of Sarcophagidae, *Ravinia peniculata* R. Parker and *Sarcophaga haemorrhoidalis* Fallen, both excreta breeders, were present in less number than *S. cooleyi* R. Parker, which breeds in carrion and decomposing animal matter. It should be remembered in discussing these figures that they represent the fly fauna for only a small part of the fly season. At an earlier or a later period the comparative abundance might be entirely different,—for example, *Musca domestica* would be practically absent in the spring, while *Muscina stabulans* would be likely to be more numerous. Similarly the species of blow-flies vary greatly in comparative numbers at different seasons.

For the purposes of comparison a list of the species reared from material from this same vault during the period of the experiment are given: *Fannia scalaris, Ophyra leucostoma, Limosina* sp., *Rhegmoclema atrata,* and *Nemopoda cylindrica.* Other species reared from material taken from deep vaults were *Desmametopa latipes* and *Leria serrata* (Powderville, Montana, 1916). There is a considerable difference between species breeding in deep vaults and those breeding in surface privies and in excrement dropped in the open. This the writer plans to discuss in another paper.

Besides the Diptera, as noted above, a number of Lepidoptera, Orthoptera and Coleoptera, as well as numerous Araneida and Phalangida were found in the Hodge traps.

It is interesting to compare the data as given for the privy trap experiment with the comparative percentages of some of the same species when trapped out-of-doors with human ex-

crement as a bait:—*Musca domestica,* 21.81; *Muscina stabulans,* 21.26; *Lucilia sericata,* 26.07; *L. caesar,* 3.31; *Phormia regina,* 11.66; *P. terraenovae,* .07; *Calliphora* spp., 1.34; *Ophyra leucostoma,* .21; undetermined Anthomyidae, 5.25; Sarcophagidae, 8.75. Under these conditions *Musca domestica* was found to exceed *Muscina stabulans* only by a fraction of one per cent. *Lucilia sericata* was the most abundant. The two experiments were conducted at the same time.

The writer desires to acknowledge his indebtedness to Mr. J. R. Parker of the Bozeman Experiment Station for the determination of the two species of Culicidae, and to Dr. W. A. Hooker, of the United States Bureau of Entomology, for the determination of *Rhegmoclema atrata.*

Two New North American Phoridae (Diptera.)

By J. R. Malloch, Urbana, Illinois.

The two species described in the present paper were collected by the writer in 1917 in Illinois. The types are in the collection of the State Natural History Survey of Illinois.

Both species are readily distinguishable from their congeners by the characters mentioned in notes at the end of their respective descriptions.

Apocephalus pictus sp. n.

♂.—Pale yellow, slightly shining. Frons black, subopaque; antennae, proboscis, and palpi yellow; arista brown; cephalic bristles black. Thorax yellow with the exception of a dark spot just below squamae. Abdomen yellow, with a large velvety black mark on each side of segments 3 to 5; hypopygium shining black; anal process yellow. Legs pale yellow; mid coxae with a black spot on posterior surface. Wings slightly yellowish; veins brown. Halteres yellow, apices of knobs black.

Frons with 8 bristles proximad of ocelli, the upper 4 in a straight transverse line, the lower 4 in a curved line, the median pair much lower than the outer and very close together; post-antennal bristles absent; frontal suture distinct; antennae very large, third joint pear-shaped and half as large as eye; arista apical; palpi smaller than third antennal joint. Mesonotum with one pair of dorso-centrals; scutellum with 4 subequal bristles; mesopleura bare. Second abdominal segment twice as long as third, with several setulose hairs on each side; hypopygium very similar to that of *pergandei* Coquillett. Legs rather stout; all coxae with several strong black bristles on anterior surface; hind femora with a fringe of setulose hairs on apical portion of antero-ventral surface; hind tarsal joints 1-4 dilated at apices and

each armed with a long subapical bristle on anterior surface; dorsal surface of hind tarsi with sparse, fine, upright hairs. Costa ending slightly before middle of wing, its divisions 7:2½:1; fringe very short and close; fourth vein regularly arcuate, ending as far before apex of wing as fifth does behind it.

Length, 2 mm.

Type locality, Havana, Illinois, August 30. Taken in a sand "blowout."

This species differs in the chaetotaxy of frons, color of abdomen and halteres, and number of scutellar bristles from *antennata* Malloch, which it most closely resembles. The only species with black halteres which is known to me is *aridus* Malloch, which is 1 mm. in length and has the third antennal joint rounded.

Aphiochaeta quadripunctata sp. n.

♂.—Black. Frons rather glossy, pleurae glossy, abdomen, with exception of hypopygium, opaque. Antennae dark brown; palpi pale yellowish; legs stramineous, mid and hind coxae and femora fuscous. Wings clear, veins black, 2 large oblong black spots near apex of wing, one on fourth vein and the other on fifth, both of which extend along the course of vein to margin of wing. Halteres black, knobs stramineous.

Frons slightly broader than high; lower transverse series of bristles convex, the inner one on each side slightly lower than outer and much closer to the latter than to the upper post-antennals; 4 strong post-antennals present, the lower pair little closer than the upper; antennae of moderate size, third joint rounded; arista very slender, pubescent, nearly twice as long as height of frons; palpi larger than antennae, armed with a few strong setulae. Mesopleurae with a number of setulae on upper posterior third; scutellum with 2 strong bristles and 2 weak anterior hairs. Abdomen subconical, with very short setulae; hypopygium small. Legs slender, fore tarsi short and distinctly thickened; hind tibiae with weak setulae on their postero-dorsal surfaces. Costa to middle of wing, first section slightly longer than 2+3, third slightly more than one-third as long as second; fringe of moderate length; fourth vein regularly arcuate, ending as far before apex of wing as fifth does behind it.

Length, 1.5 mm.

Type locality, Elizabeth, Illinois, July 8.

No described species of this genus has the wings spotted as this one. In 1912 I described *conglomerata* which has a black spot at apex of wing, but in this species the spot consists of numerous microscopic black hairs and not of a dark pigmentation of the membrane as in *quadripunctata*.

ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., APRIL, 1918.

As to Types.

Perhaps since the following list of kinds of types has gone to the printer it has been increased to at least 57 varieties: Type, Holotype, Allotype, Cotype, Paratype, Syntype, Morphotype, Lectotype, Plesiotype, Neotype, Heautotype, Plastotype, Monotype, Chirotype, Apotype, Hypotype, Autotype, Ideotype, Androtype, Gynetype, Topotype, Orthotype, Haplotype, Logotype and Pseudotype.

The invention of new names for kinds of types has followed the discovery that the word type in the past had no very exact meaning and now the pendulum has swung to an absurd degree and has gotten perilously near to perpetual motion. The sensible thing to do would be for some one to grasp the pendulum and swing it back to the word type and give the word its exact present meaning.

The International Entomological Congress has accepted the principle of the single type. The Entomological Society of America has thus far not accepted the single type idea.

It is foolish to expect anyone of ordinary mind to remember the meanings of such an aggregation of verbiage as the above list shows. We would advocate the use of very few of these terms, probably three are quite sufficient for ordinary mortals—type, paratype and lectotype. Very learned individuals may wish to go the whole gamut and unfortunately there is no law to prevent people from being foolish. Lectotypes should be established with the greatest care.

Our remarks, of course, do not apply to minute insects like the Coccidae. In such cases a single slide should be considered the type. The establishment of a single type is absolutely essential for systematic work, as the fixing of a name, in conjunction with a specimen of the insect it represents, is necessary for the founding of a sound and enduring nomenclature. Even the persons who use all the varieties appear to be a bit hazy as to what they all mean. H. S.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

Moths Lively after a Low Temperature (Lep.).

Early in December, on the day after 8° of frost had been registered, some female Winter moths, *Cheimatobia brumata*, were found on an apple tree in a perfectly lively condition. One male was found on the same day. This appears to indicate that the pests can withstand a considerable severity of frost.—*The Gardener's Chronicle*, London, Jan. 12, 1918, p. 11.

Interesting Butterfly Occurrences at Beeville, Texas (Lep.).

During the past few years I have received, from time to time, some interesting butterflies from Beeville, Texas, and as some of them are exceedingly rare in the United States, I feel that they should be recorded for the benefit of other lepidopterists.

The insects were collected by Miss Pattie Hutchinson, who kindly furnished in addition to most of the insects themselves the data on which this article is based.

Cydimon poeyi Gundlach—One specimen of this tropical swallow-tail was captured by Miss Hutchinson at Beeville, June 17, 1916. It agrees with figs. 6 & 7, Pl. CXXI, in "Reise der Oesterreichischen Fregatte Novara um die Erde." (Trip of the Austrian Frigate Novara around the World.) It is apparently a Central American species, as Dr. Wolcott of Lincoln, Nebraska, has in his collection a specimen taken at Pozo Azul, Costa Rica, by M. A. Carriker, June, 1902.

Pieris amaryllis var. *josepha* G. & S.—2 ♂ & 1 ♀ taken Sept. 18, 1916. Miss Hutchinson reports that she observed a good many more during a period of about a month, saying they were found on wild sun flowers. Nearly all were more or less worn.

Catopsilia philea Linn.—Miss Hutchinson reports the capture of one specimen at Beeville by Mary Miller, a school girl of that place.

Catopsilia agarithe var. *maxima* Neum.—A nice series, both sexes, collected during Aug. & Sept., 1916.

Gonepteryx clorinde Godt.—One specimen taken by Miss Hutchinson Sept. 6, 1916, and another by Miss Mary Miller, about the same date.

Kricogonia lyside Godt.—A nice series received. Collected during May, 1916. The males are mostly form *terissa*, while among the females is one form *unicolor* and one form *fantasia*.

Melitaea theona var. *bolli* Edw.—2 ♂ & 2 ♀ received. These were reared from larvae found on a native shrub called "Ceniza blanca" (Spanish for white ashes) emerging Oct. 7 & 14.

Eudamus dorantes var. *rauterbergi* Skin.—1 ♂ & 1 ♀ received. Collected Oct. 16, 1916. A number of others collected during October and a few in the spring.

Eudamus albofasciatus Hew.—5 specimens collected during Sept., 1916.

Murgaria albociliata Mab.—3 ♂ & 1 ♀ received. Collected during March & September, 1916.

Celotes nessus Edw.—1 specimen collected Sept. 30.

Systasea pulverulenta Feld.—1 specimen collected Sept. 30, 1916.—R. A. Leussler, Omaha, Nebraska.

Genitalia of Rhynchophora—Material Wanted (Col.).

When Mr. Fred Muir was in New York there was naturally much conversation about the joint paper of Sharp & Muir,[1] on the genitalia of beetles and I was glad to learn that Dr. Sharp was continuing the study, especially in the Rhynchophora, and that I could be of some service by sending him a few American forms that he needed for study. This has been done and I have now a letter reading in part as follows: "*Ithycerus* is extremely interesting. It has most complicated and remarkable genitalia, which prove beyond a doubt that it must be associated with the Belidæ; a family that is at present not recognized as represented in North America, though it is known to occur in the Andean region of South America. I have not yet been able to procure any of the South American forms, but shall try to do so and let you know about them. Meanwhile I will be much obliged if you will publish my statement and say that I shall be very much obliged if I can get some additional material of *Ithycerus* to complete the investigation which is very difficult in certain respects. Specimens *killed in ether*, and afterwards transferred to distilled water, would probably help, even more than dried specimens. Spirit specimens are good, but not so good as other ones, as the spirit causes the delicate muscles to stiffen."

In addition to *Ithycerus*, specimens of the genera *Dirotognathus*, *Acamptus*, *Calandrinus*, *Hormops* and *Yuccaborus* are needed and may be sent to me or direct to Dr. David Sharp, Lawnside, Brockenhurst, Hants, England, by anyone who has them to spare and wishes to assist in the investigation.—Charles W. Leng, Staten Island, N. Y.

Some Species of Copaeodes (Lep.).

The first species described was *aurantiaca* Hew. No locality was given and the description is remarkable for brevity. It is as follows: "Upperside orange-yellow with the base of both wings brown. Underside as above. Exp. 7-10 inch." Dr. J. H. McDunnough says he has seen the type in the British Museum and that the name is correct for the species generally known as *procris* Edw.

Waco Edw. was described in 1868 from one male, from Dr. Lincecum. Dr. Lincecum at that time lived at Long Point, Texas. This place is in Washington county, southeast of Waco. Perhaps the name indicates that the types were taken at Waco.

Minima Edw. was described in 1870 and the male type was from Waco, Texas, (G. W. Belfrage).

Procris Edw. was described in 1871 and the type locality was given as near Waco, Texas, (G. W. Belfrage).

In 1890 Wright described *candida* and gave as the type locality "cañons in the foothills of southwestern California." This is a pure synonym of *aurantiaca*.

Barnes and McDunnough in their *Contributions*, 1913, III, 100, described *rayata* as a new species and figured both sexes. They say the white dash on the under side of the secondaries renders their species very easily recognized. Type locality, San Benito, Texas.

The relationship of all these names is interesting. Godman and

[1] The comparative anatomy of the male genital tube in Coleoptera by D. Sharp, M.A., F.R.S. and F. Muir, F.E.S. (Trans. Ent. Soc. Lond., Dec., 1912, pp. 477-642, plates XLII-LXXVIII).

Salvin in the Biologia figure the *rayata* form as *aurantiaca* and put all the other names into the synonymy except *rayata*, which had not then been described. I have only seen the *aurantiaca* form from California and Arizona and both forms from Texas. Most of the Texan specimens we have show the white ray on the underside of the secondaries. It is probable that all the names represent one species. *Waco, minima* and *procris* have the same type locality.

Mr. Edwards in his description of *procris*, female, says: "On the under side of secondaries the yellow color only obtains next abdominal margin; rest of wing yellow brown, with a pale, whitish, streak running from base to middle of hind margin." *Rayata* is therefore a synonym of *procris*, unless it can be shown that the sexes of *procris* were different species. Even so we would then have to reckon with *waco* and *minima*.

It would appear that the species is *aurantiaca* and with *procris* as a variety, characterized by a white ray on the underside of the secondaries.—Henry Skinner.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new species are all grouped at the end of each Order of which they treat. Unless mentioned in the title, the number of the new species occurring north of Mexico is given at end of title, within brackets.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

4—The Canadian Entomologist. **6**—Journal, New York Entomological Society. **8**—The Entomologist's Monthly Magazine, London. **9**—The Entomologist, London. **11**—Annals and Magazine of Natural History, 9th series, London. **21**—The Entomologist's Record, London. **34**—Proceedings, Iowa Academy of Sciences, Des Moines. **37**—Le Naturaliste Canadien, Quebec. **51**—Novitates Zoologicae, Tring, England. **60**—Anales, Museo Nacional de Buenos Aires. **90**—Revue Scientifique, Paris. **115**—Oversigt Kongelige Danske Videnskabernes Selskabs Forhandlinger Copenhagen. **172**—The American Museum Journal, New York. **181**—Guide to Nature, Sound Beach, Conn. **394**—Parasitology, Cambridge, England. **411**—Bulletin, The Brooklyn Entomological Society. **420**—Insecutor Inscitiae Menstruus: A monthly journal of entomology, Washington. **438**—Bulletin, Illinois State Laboratory of Natural History, Urbana. **447**—Journal of Agricultural Research, Washington. **513**—South African Journal of Sciences,

Cape Town. **519**—The Scientific Monthly, Lancaster, Pa. **556**—Zoological Society Bulletin, New York. **557**—Journal, Board of Agriculture, London.

GENERAL SUBJECT. **Beebe, W.**—Label making in the field, **556,** xxi, 1574. **Bouvier, E. L.**—Les guerres d'insectes, **90,** lv, 737-741. **Crampton, G. C.**—A phylogenetic study of the terminal abdominal segments and appendages in some female apterygotan and lower pterygotan insects, **6,** xxv, 225-37. **Kearfott, W. D.**—Obituary notice of, **4,** 1918, 71-2. Obituary notice and bibliography, **6,** xxv, 238-9. **Palm, C.**—Obituary notice, **6,** xxv, 237-8. **Sheldon, W. G.**—On a cure for entomological specimens affected by verdigris, **9,** 1918, 30-3.

MEDICAL. **Brues, C. T.**—Insects and the national health, **519,** vi, 193-209. **Nuttall, G. H. F.**—The part played by Pediculus humanus in the causation of disease, **394,** x, 43-79.

ARACHNIDA, ETC. **Eales, N. B.**—Cheese mites, **557,** xxiv, 1087-96. **Sorensen, W.**—Sur la morphologie de l'abdomen des Araignees, **115,** 1916, 351-93.

NEUROPTERA, ETC. **Garman, P.**—The Zygoptera, or damsel-flies, of Illinois, **438,** xii, 411-587. **Howlett, F. M.**—Notes on head- and body-lice and upon temperature reactions of lice and mosquitoes, **394,** x, 186-8. **Nuttall, G. H. F.**—Bibliography of Pediculus and Phthirus. The biology of Pediculus humanus, **394,** x, 1-42; 80-185. **Wells, L.**—Odonata of Iowa, **34,** xxiv, 327-333.

ORTHOPTERA. **Brethes, J.**—Descripcion de una nueva mosca langosticida, **60,** xxviii, 141-44. **Caudell, A. N.**—Homocoryphus malivolans in Texas, **411,** xii, 21-2. **Marelli, C. A.**—Las diferentes larvas de langostas que acompanan a las grandes mangas de la saltona de Schistocera paranensis, **60,** xxviii, 345-90.

HEMIPTERA. **Dickerson & Weiss**—Idiocerus scurra, a poplar leafhopper, **6,** xxv, 218-24. **Fontanel, P.**—Une nombreuse posterite. Le puceron de la rudbeckie (Golden glow aphis), **37,** xliv, 115-123. **Olsen, C. E.**—Notes on Draeculacephala inscripta, **6,** xxv, 215-18.

Davis, W. T.—Sonoran cicadas collected by H. H. Knight, J. Bequaert and others, with descriptions of [5] new species, **6,** xxv, 203-15. **Gibson & Wells**—The genus Ophiderma [2 new], **6,** xxv, 199-203. **Knight, H. H.**—New sps. of Platylygus with a note on the male of Largidea grossa [2 new], **411,** xii, 16-18.

LEPIDOPTERA. **Dyar, H. G.**—Brabantia rhizoleuca redescribed, **420,** v, 169. **Engelhardt, G. P.**—Papilio thoas feeding on

Ruta graveolens, **411,** xii, 22. **Gravatt, G. F.**—Gipsy-moth larvae as agents in the dissemination of the white-pine blister-rust, **447,** xii, 459-62. **Jorgensen, P.**—Las mariposas argentinias, Famila Pieridae, **60,** xxviii, 427-520. **Kaye, W. J.**—New species and races of Ithomiinae in the Joicey collection, **11,** i, 77-86. **Prout, L. B.**—New L. in the Joicey collection, **11,** i, 18-32. **Rothschild, L.**—Some new moths of the families Arctiidae and Eupterotidae, **51,** xxiv, 475-92.

DIPTERA. Bacot, A.—A note on the period during which the eggs of Stegomyia fasciata from Sierra Leone stock retain their vitality in a humid temperature, **394,** x, 280-3. **Brethes, J.**—Algunas notas sobre mosquitos argentinos, **60,** xxviii, 193-218. **Dyar, H. G.**—A second note on the species of Culex of the Bahamas. The larva of Aedes idahoensis, **420,** v, 183-87; 187-8. **Howlett, F. M.**—(See under Neuroptera, etc.). **Mally, C. W.**—Note on the eversion of the ptilinum during the emergence of the housefly, **513,** xiii, 599.

Alexander, C. P.—New Nearctic crane-flies—IV. [10 new], **4,** 1918, 60-71. **Dyar & Knab**—New American mosquitoes [4 new]. The genus Culex in the U. S. [2 new], **420,** v, 165-69; 170-83. **Malloch, J. R.**—A new sp. of Hartomyia from Illinois. Notes on Chloropidae, with descriptions [of 2 n. g.; 1 n. sp.], **411,** xii, 18; 19-21. **Townsend, C. H. T.**—New genera of Amobiinae [11 n. g.], **420,** v, 157-65.

COLEOPTERA. Champion, G. C.—Note on the curculionid genus Sysciophthalmus, with a description of a n. sp. from Tierra del Fuego, **8,** 1918, 35. Notes on various South Am. C. collected by Charles Darwin during the voyage of the "Beagle," with descriptions of n. gen. and sps., **9,** 1918, 43-48 (cont.).

Blatchley, W. S.—On some new or noteworthy C. from the west coast of Florida—IV. [4 new], **4,** 1918, 52-59. **Van Dyke, E. C.**—Some new beetles in the families Cantharidae, Ptinidae, and Scarabaeidae, from western N. A., with notes upon others [1 n. g.; 14 n. sps.], **411,** xii, 1-15.

HYMENOPTERA. Bigelow, E. F.—How honeybees produce honeycomb, **181,** x, 259-72. **Gallardo, A.**—Las hormigas de la Republica Argentina. Subfamila Dolicoderinas. Notas acerca de la hormiga Trachymyrmex pruinosa. Notas complementarias sobre las Dolicoderinas argentinas. Notes systematiques et ethologiques sur les fourmis Attines de la Republique Argentine, **60,** xxviii, 1-130; 241-52; 257-62; 317-44. **Heslop Harrison, J. W.**—The pairing habits of certain bees, **21,** xxx, 11-12. **Holmberg, E. L.**—Las especies argentinas de Coelioxys, **60,** xxviii, 541-91. **McAtee, W.**

L.—The biting powers of ants, **172**, xviii, 141-7. **Perkins, R. C. L.** —The synonymy of Andrena wilkella and its allies, with notes on habits, as confirming specific distinction, **9**, 1918, 36-9. **Verner, S. P.**—Ant pests and ant-eating animals, **556**, xxi, 1575.

CATALOGUE OF THE HEMIPTERA OF AMERICA NORTH OF MEXICO, EXCEPTING THE APHIDIDAE, COCCIDAE AND ALEURODIDAE. By EDWARD P. VAN DUZEE. University of California Publications, Technical Bulletins, vol. 2, pp. i-xiv and 1-902. (Paper $5.00, cloth $5.50. In the East it may be had at the University of California Press, 280 Madison Ave., New York.)

Through this work, Mr. Van Duzee definitely assures his leadership of present-day American hemipterists. I voice the mind of his colleagues in this country in congratulating him and ourselves on this very valuable volume. For years to come this Catalogue will be the basis of all work in Hemiptera for our fauna; all must refer back to it to agree or to disagree. It is indispensable.

The Catalogue is carried out on the excellent plan of Oshanin's *Verzeichniss der palaearktischen Hemipteren mit besonderer Berücksichtigung Ihrer Vertheilung im Russischen Reiche*,* the only work on a restricted fauna to which it may be compared. It differs from Oshanin in that the references given are only such as are material. Oshanin lists every reference. The classification follows Reuter—with mitigations. Horvath is guide in matters of nomenclature. Many types are renovated or changed to agree with the author's interpretation or understanding of the International Code. This question of nomenclature and priority will always be with us to vex until we come to an agreement as to what constitutes priority, so framed that no room will be left for personal interpretation. We must also put the casual biologists—the science teacher, the sanitarian, the physician—in a position where they shall not be able to dictate to the specialist what his names must be, lest a change compel the casual to learn perhaps three or four new names.

The arrangement of the aquatic and semi-aquatic forms is not satisfactory, but this must be the subject of more extended comment.

Generic and specific indices add greatly to the completeness and usefulness of the work.

The volume as a whole is surprisingly free from errors, except of typography; a little more exacting editing would have done away even with these few.

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* Beilage zum Ann. Mus. Zool. Acad. Imp. Sci. St. Petersb., Bd. XI-XIV, pp. i-xxiv, 1-1087, 1906-09; Bd. XI, XII, XIII, pp. i-xvi, 1-492, 1906-08; Bd. XV, pp. i-xvi, 1-217, 1910.

We shall doubtless have a series of articles correcting, expanding and improving this truly great work, of which one is threatened above. Meantime, no working hemipterist can afford to do without this, the first, real, authoritative Catalogue of our Hemipterous fauna. Some may get it to curse, but all will keep it to bless.—J. R. de la Torre Bueno, White Plains, New York.

Field Book of Insects. With special reference to those of Northeastern United States, aiming to answer common questions. By Frank E. Lutz, Ph.D., Associate Curator, Dept. of Invertebrate Zoology, American Museum of Natural History. With about 800 illustrations, many in color. G. P. Putnam's Sons, New York and London, The Knickerbocker Press, 1918, Pp. ix, 509. $2.50.

The very first thing the author of this attractive volume tells us is that ten years ago he felt sure there was little excuse for additional general entomologies. He doesn't admit that his opinion has changed, but rather throws the burden of this book on the publishers who evidently wished to extend a series of "Field Books" already in existence. We believe that this *is* the most convenient pocket book on all groups of North American insects that has yet appeared. It measures 7 x 4¼ x 1 inches, weighs 15 ounces, is printed in clear type of the same size as that in which these words are and well spaced, and deals (so it claims) with about 1400 species, of which nearly 600 are illustrated by one or more figures. In selecting the species to be discussed Dr. Lutz has been guided by what the public, in evidence at his museum, seem to want to know. The two extremes of desire appear to be, "How much is a moth worth?" and "Why are bed bugs?" An answer to the former is given on page 154, but we have looked in vain on page 106 (and elsewhere) for any response to the other, assuredly more philosophical, conundrum. We are far from laying anything against the author for this omission, however. The book is entertainingly written and every here and there the reader is made acquainted, by means of a well-chosen and not superfluous passage, with some of the best entomological literature. Who will soon forget the venerability of the cockroach after reading page 62? Ever and anon the author gives us one of his own witty sayings as when, in discussing some of the difficulties of the classification of the Serricorn Coleoptera, he remarks that nature apparently does not use a card catalog (p. 306), while farther down on the same page is the delicious story of the Breakbacks.

The insects are taken up seriatim by orders (24 of them), but the Lepidoptera, Diptera, Coleoptera and Hymenoptera occupy about 340 of the 509 pages. Here and there are keys to the more interesting families, genera or species. Great reliance for identification is naturally placed on the figures, about 700 of which are new and the work of Mrs. E. L. Beutenmüller. The colored illustrations are on 24 plates

which, curiously, are not numbered, except in the list on pages vii-ix, although the black and white plates bear their proper serial numbers. Many of the four-color figures have a slight blurred effect in the printing, unfortunately. The introduction tells very briefly of nomenclature, growth and structure and much more fully of collecting and preserving insects and the control of injurious insects. This book will do much for entomology.—P. P. CALVERT. (*Advt.*).

Doings of Societies.

Meeting of Ohio Entomologists.

For some years it has been the custom for the entomologists of Ohio institutions to hold an annual meeting, the main purpose being to correlate the entomological activities of the State. Such meetings are open to active entomologists and students specializing in entomology.

At the recent meeting held in the Botany and Zoology building of the State University, at Columbus, on January 29, 1918, thirty-seven entomologists were present and the following program was rendered:

General.—Herbert Osborn: Entomological objectives in the Biological Survey. F. H. Krecker: Insect fauna of rock-bottom ponds.

Economic.—E. W. Mendenhall: Observations on some insects in nurseries for the year 1917. J. S. Hine: Apicultural conditions in Ohio. D. M. DeLong: Remarks on work with tobacco pests and leaf-hoppers. D. C. Mote: Experiments with Sodium fluoride in controlling sheep lice. A. J. Basinger: A survey of greenhouse pests for Columbus and vicinity. J. S. Houser: The insect outbreaks in southern Ohio woodlands, 1916-17. J. R. Stear: Geographical distribution of the insect pests of Ohio for 1917. C. A. Weigel: On the penetration of insecticides. T. L. Guyton: The potato aphid outbreak of 1917. Richard Faxon: The control of animal parasites at the front.

Arachnida.—Wm. M. Barrows: Observations on field and meadow spiders.

Homoptera.—H. A. Gossard: The periodical cicada in Ohio in 1917. R. K. Fletcher: Observations on Miridae. J. C. Hamlin: Observations on Membracidae. (See also Hymenoptera).

Hymenoptera.—F. A. Fenton: Notes on Leaf-hopper parasites.

Lepidoptera.—R. S. McKay: The evergreen bag-worm, habits and food plants.

Diptera.—C. L. Metcalf: Notes on Syrphidae.

J. S. HOUSER, *Sec'y.*

OBITUARY.

Dr. Samuel Gibson Dixon, President of The Academy of Natural Sciences of Philadelphia since 1896, and Commissioner of Health for the State of Pennsylvania since 1905, died in Philadelphia, February 26, 1918, after an illness of eight months. He was born in Philadelphia, March 23, 1851, studied successively law and medicine in the University of Pennsylania, and bacteriology and hygiene in King's College, London, and Pettenkofer's laboratory at Munich. He was assistant demonstrator in physiology in the University of Pennsylvania 1886-88, professor of Hygiene 1888-90, and later a trustee of the same institution. His activity in The Academy of Natural Sciences began about 1890 in connection with bacteriological work and in the following year he became a curator, a function which he filled to the end of his life. Largely through his efforts the Legislature of Pennsylvania was induced to make a number of appropriations to the Academy by means of which its buildings were greatly extended and strengthened. These additions and improvements were his chief contribution to the institution's progress and welfare and will stand as an enduring monument to his labor and devotion.

As Commissioner of Health for Pennsylvania he took much interest in the relation of insects to disease, directed the making of a mosquito survey of the State in 1906 by Mr. H. L. Viereck (to which references will be found in the News xvii, 150; xviii, 29-30), and promoted investigations of the possible role played by flies in the transmission of infantile paralysis.

Charles Arthur Hart was born at Quincy, Illinois, October 12, 1859, and from 1884 to the day of his sudden death, February 18, 1918, was connected with the office now officially designated as the Illinois State Natural History Survey.

That the collections of the Survey are among the largest,

and undoubtedly the most comprehensive, in the United States is largely due to the untiring efforts of Mr. Hart, while the arrangement and classification are almost entirely his.

The handicap of a lack of an entomological course such as is now possible to students was to a very large extent overcome by studious application to the work of classification, and an exceptional natural aptitude. Always a keen and observant field collector, the opening of the biological station on the Illinois River, at Havana, in 1894, provided him with an exceptional opportunity to indulge in research into the life-histories of aquatic insects, and as a part result of this work he published his paper on the Entomology of the Illinois River in 1895. This paper is a model for work of this nature, containing as it does, besides many statistical and systematic data, many observations on the life-histories of the forms dealt with which are presented in a readable and interesting manner. In addition to this paper Mr. Hart drew up manuscript keys to various orders of insects in their different stages, and to mollusca, for use in the summer school at Havana. Apart altogether from the knack of assembling in orderly array and uniformly labeling the multitude of preserved specimens in the laboratory, which Mr. Hart possessed to a marked degree, he at all times bore in mind the biologic and economic habits and characteristics of these forms, something that is becoming undeniably rarer in these days of specialization.

The paucity of Mr. Hart's publications is not to be accepted as a criterion of his knowledge of entomology, nor as an indication of inability to handle such undertakings, as his knowledge, in my opinion, was both ample and varied, and his published works show his ability to lucidly express himself, but rather denotes, at least to those who knew him, the degree of self-repression which he exercised in order that his appointed task, the arrangement of our collections, should be accomplished. At the time of his death this task was still incomplete, being interrupted in the Orthoptera, but he left things in such condition that it will be possible to take up the work where it was left unfinished.

He left one paper, the manuscript of which is fairly ready, on the Pentatomoidea of Illinois, and this I have undertaken to complete, mostly from his notes, and publish.

From my four and one-half years of constant association with him, I conclude that, as a factor in broadening the scope of systematic entomology and in linking it up with other branches of nature study, he played a very important part, not only through his published papers but through the influence he exercised upon university students with whom he came in contact. He saw clearly that, in order to command attention and prove its economic value commensurate with the expenditure demanded for it, entomology should be considered in its broadest possible aspect, and the lack of published papers by him is in large measure due to the fact that the amount of work for which he assumed responsibility left him but little time for the preparation of papers.

Although never robust he devoted many hours more daily to his work than he was called upon to do, a characteristic found almost exclusively among scientists who pursue their studies because of inclination and not of necessity.

His earliest work was principally done on Coleoptera, but in later years he devoted much time to Odonata, publishing one paper in collaboration with J. G. Needham, and to the Orthoptera. His principal work during the last six years was done on the Hemiptera and it is unfortunate that his untimely death prevented him from publishing his results.—J. R. Malloch.

Charles Palm, one of the founders of the New York Entomological Society (organized June 29, 1892), born at Calbe, Germany, in 1836, died November 5, 1917. An obituary notice and portrait are published in the *Journal* of the Society for December, 1917 (Vol. XXV, pp. 237-8, pl. 18).

Despatches published in the daily press announced the death, from his own hand, of Adolph Friedrich VI, grand-duke of Mecklenburg-Strelitz, on February 23, 1918, near his castle at Neu-Strelitz. He was born at Neu-Strelitz, June 17, 1882,

son of the grand-duke Adolf Friedrich V, whom he succeeded on his father's death, June 11, 1914. He is said to have served brilliantly with Von Mackensen in Serbia in 1915, being the first officer to cross the Danube, and was credited with storming Fort Elisabeth almost single-handed.

The relationship of the deceased to the entomological world is chiefly through his leadership of two important African expeditions, both of which secured very extensive entomological collections. One of these expeditions, the German Central Africa Expedition of 1907-1908, of which Dr. H. Schubotz was the zoologist, traversed the country between Victoria Nyanza and Lake Kivu in western German East Africa; explored the Virunga Volcanoes, the lower slopes of Ruwenzori and the Ituri River region of the northeastern Belgian Congo. The second expedition, the Second German Central Africa Expedition of 1910-1911, on which Drs. Schubotz and Arnold Schultze were zoologists, visited the lower Congo basin and lower Ubangi River, one party going down the Shari River to Lake Tchad and returning to the west coast by way of the Niger River, another party traversed the southern Cameroons to the west coast and two other sections, by different routes, traveled the Uelle-Ubangi system, across the watershed and down the Nile.

On the entomological collections of the first expedition twenty-three reports had appeared up until the time when communication with Germany was discontinued. Of these seven were on the Hymenoptera and the same number on the Coleoptera, while two were on the Orthoptera and one each on Plecoptera, Dermaptera, Collembola, Thysanoptera, Trichoptera, Hemiptera and Lepidoptera, the authors being Kieffer, Strand, Bischoff, Stitz, Szepligeti, Lesne, Pic, Hintz, Kerremans, W. Horn, Bernhauer, Klapálek, Burr, Grünberg, Borchmann, Jacobi, Weise, Enslin, Gebien, Ulmer, Karny, Börner, Schulthess-Rechberg, Kolbe, Shelford and Rehn. These reports were published as sections of the natural history results of the expedition—*Wissenschaftliche Ergebnisse der Deutschen Zentral-Afrika-Expedition* 1907-08. The results of the second expedition have been appearing in a similar series—*Ergebnisse der Zweiten Deutschen Zentral-Afrika-Expedition* 1910-1911. To date nine entomological sections have been received in Philadelphia, five on Coleoptera, one on Mecoptera, two on Hymenoptera and one on Hemiptera. The authors of these are: Weise, Enslin, Szepligeti, Melichar, Sjöstedt, Gebein, Moser, Ohaus, Bickhardt and Kerremans.—J. A. G. Rehn.

Erratum.

Page 119, line 18 (March, 1918), for **Coleoptera** read **Lepidoptera.**

EXCHANGES.

This column is intended only for wants and exchanges, not for advertisements of goods for sale. Notices not exceeding three lines free to subscribers.

☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

Wanted for cash or exchange.—Buprestidae and Cerambycidae new to my collection.—J. N. Knull, Hummelstown, Pa.

Duplicate Rhopalocera from Japan and Formosa. Desiderata—Those from the world.—S. Satake, No. 48 Aoyamaminamimachi 5 chome Tokyo, Japan.

Cicindelidae Wanted—I wish to obtain for purposes of study, Cicindelas, "tiger beetles," from the Southern and Gulf States. Correspondence desired.—Edwin E. Calder, Longmeadow, R. I.

Wanted—North American Coleoptera for exchange. Please send lists to V. Harnach, 1759 W. 20th St., Chicago, Illinois.

South American Erycinidae and Lycaenidae are offered in exchange for North American moths (Noctuids, Geometers, etc.).—G. Chagnon, P. O. Box 521, Montreal, Canada.

Wanted—Monog. des Buprestides—Kerremans, Vol. II, Pt. 1; Bibliog. Econ. Ent., Pt. IV; Mo. Bul. Cal. Com. Hort., Vol. I, No. 9, and Vol. II, Nos. 3 and 4.—E. A. Klages, Crafton, Pa.

Wanted—Friendly correspondence and exchange of Lepidoptera. Send your address and offerta. Will reply promptly.—F. E. Potter, 267 So. Main St., New Britain, Conn.

For Exchange—A few specimens, mostly Sphingidae and Saturniidae common to this region, for species from some other part of the country.—Dr. Elmer T. Learned, Fall River, Mass.

Lepidoptera—I have for exchange first class specimens of *Papilio floridensis, palamedes, Pholus fasciatus, tersa, hylaes, undulosa, Apatela tritona, Leucania pilipalpis, extincta, subpunctata, Gortyna u-album, Syneda graphica,* and hundreds of others from Pa. and Fla. Send lists, or address F. W. Friday, 82 Jacob St., Fair Haven, Pittsburgh, Pa.

Catocalae—For exchange perfect specimens of *C. pura, C. aspasia* and var. *sara, C. faustina* var. *lydia, C. praeclara.* Desire other *Catocalae.* Some of the common species wanted.—John H. West, 2057 E. York St., Phila., Pa.

Wanted to Exchange—I wish to exchange Rhopalocera from eastern United States for those of the western and southern part. Correspondence desired. Paul N. Musgrave, Pennsboro, W. Va.

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ARACHNIDA.

2081.—**Ewing** (H. E.).—The beetle-mite fauna of Mary's Peak, Coast Range, Oregon [12 n. sps.], (Ent. News, **29**, 81-90, 1 pl., '18) ..... .20

ODONATA.

2079.—**Stout** (A. L.).—Variation in labial characters in the nymph of Gomphus spicatus (Ent. News, **29**, 68-70, ill., '18) ..... .10

COLEOPTERA.

2073.—**Blaisdell** (F. E.).—Studies in the Tenebrionidae [2 new], (Ent. News, **29**, 7-14, '18)..... .20

2074.—**Garnett** (R. T.).—Notes on Dinapate wrightii (Ent. News, **29**, 41-44, 1 pl., '18) ..... .20

DIPTERA.

774.—**Cresson** (E. T., Jr.).—Costa Rican Diptera collected by P. P. Calvert. Paper 3. A report on the Ephydridae [2 n. g.; 22 n. sps.], (**44**, 39-68, 1 pl., '18) ..... .50

HEMIPTERA.

775.—**Gibson** (E. H.).—The genus Corythucha (Tingidae), [21 n. sps.], (**44**, 69-104, '18) ..... .55

772.—**Swain** (A. F.).—New Aphididae from California [9 n. sps.], (**44**, 1-24, 2 pls., '18) ..... .50

HYMENOPTERA.

773.—**Cockerell** (T. D. A.).—Neotropical bees, principally collected by Prof. Bruner in Argentina [15 n. sps.], (**44**, 25-38, '18) ..... .25

2082.—**Robertson** (C.).—Some genera of bees [6 n. g.], (Ent. News, **29**, 91-92, '18) ..... .10

2084.—**Rohwer** (S. A.).—Notes on and descriptions of the Nearctic wood-wasps of the genus Xiphydria [1 n. sp.], (Ent. News, **29**, 105-111, '18) ..... .15

LEPIDOPTERA.

2083.—**Williams** (R. C.).—The genus Lycaena, Enoptes group (Ent. News, **29**, 99-102, 3 pls., '18) ..... .20

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